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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,100	06/15/2001	Arthur J. Carlson	13148US02	7713

23446 7590 09/04/2007

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EXAMINER	
PERILLA, JASON M	
ART UNIT	**PAPER NUMBER**
2611	

MAIL DATE	DELIVERY MODE
09/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/882,100	CARLSON, ARTHUR J.	
	Examiner	Art Unit	
	Jason M. Perilla	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-22 are pending in the instant application.

Response to Arguments

2. The Applicant's arguments filed August 16, 2007 against the prior art rejections of claims 1-22 as being unpatentable over Bremer et al (US 6546090; "Bremer") in view of Dirschedl et al (US 6262994; "Dirschedl"), and in further view of Gross et al (6,549,520; hereafter "Gross") have been considered, but they are not persuasive.

Regarding the rejection of claims 1-22 under 35 U.S.C. § 103(a), the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The Applicant's first argument is that the prior art of record discloses determining an error rate and not, specifically, a data rate. While it is admitted that Dirschedl discloses determining an error rate rather than a data rate, it is submitted by the Examiner that such difference in distinctions, to one having ordinary skill in the field of digital communications, is very little. Furthermore, notwithstanding the fact that the similarities between determining an error rate and a data rate are notoriously known in the art, the Examiner has provided objective evidence through the prior art reference Gross that illustrates understanding of the similarities in the field of art. Although the

Applicant notes that an error rate and a data rate are not specifically equivalent, the Applicant has conceded Gross's teaching that "an error rate can have an effect on the maximum data rate that can be achieved in a system". Therefore, Gross illuminates what is already notoriously known in the art of data communication. That is, the fact that data rates and error rates are, although not strictly equivalent, *art recognized functional equivalents*. As previously noted, the determination of an error rate as described by Dirschedl necessitates the determination of a data rate because an "error rate" is not simply "errors" but rather *errors per unit data*. Therefore, when an error rate is determined, an amount of data is also determined, and such distinction is obvious to one having ordinary skill in the art. Finally, the Applicant has provided no secondary considerations of non-obviousness such as (1) the invention's commercial success, (2) long felt but unresolved needs, (3) the failure of others, (4) skepticism by experts, (5) praise by others, (6) teaching away by others, (7) recognition of a problem, or (8) copying of the invention by competitors.

The Applicant's second argument is that Dirschedl doesn't disclose "forming symbols using a *predetermined number* of bits per symbol if the data rate is above the threshold; and allowing symbols to be formed using *any integer number* of bits per symbol is the data rate is below the threshold." Furthermore, the Applicant notes that the Examiner's use of Dirschedl's disclosure of using 2, 4, and 8 PSK (col. 2, line 45) can not, appropriately, be used for the proposition that Dirschedl discloses a predetermined number of bits per symbol being 2. The Examiner agrees with the Applicant that 2, 4, and 8 PSK refers only to the number of phases in the constellation

space and not the number of bits per symbol. Nonetheless, as also explained in the rejections below, as broadly as claimed, the predetermined number of bits may be considered to the 1 and the any integer number of bits may also be considered to be 1.

The Applicant's final argument is that the prior art combination does not disclose obtaining a data rate *during initialization*. The Applicant points out that Dirschedl discloses that, initially, the system variables are set to "medium" settings. Nonetheless, Dirschedl's disclosure does not limit it's use to some point in time much later than a power on time. That is, the invention of the prior art could reasonably be expected to determine a data rate upon the first instance of data transmission or an *initialization period*. Finally, as broadly as claimed, any time that a data rate is determined in the prior art combination could reasonably be considered to be an initialization period.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bremer et al (US 6546090; "Bremer" – previously cited) in view of Dirschedl et al (US 6262994; "Dirschedl" – previously cited), and in further view of Gross et al (6,549,520; hereafter "Gross").

Regarding claim 1, Bremer discloses an ADSL system (abstract; col. 6, lines 45-55) for the transmission of high bit rate data services. Bremer does not disclose a

method of restricting symbol size in an ADSL system. However, Dirschedl teaches a method of restricting symbol size in an system (abstract; col. 1, lines 40-55) comprising: obtaining information regarding the data rate during initialization (col. 2, line 63 – col. 3, line 9); comparing the information to a threshold (col. 3, lines 13-25); forming symbols (i.e. 1, 2, or 3 bit symbols using 2, 4 and 8 PSK) using a multiple of a predetermined number (i.e. 1) of bits if the information is above the threshold (col. 2, line 45); and allowing symbols to be formed using an integer number of bits per symbol if the information is below the threshold (col. 2, line 45). Dirschedl teaches a method wherein data is gathered at the side of a receiver regarding the current bit per symbol error rate (col. 2, lines 63-68) and the data is transmitted to a transmitter of the data. A success/fail determination or threshold is compared at the transmitter to determine the quality of the transmission (col. 3, lines 13-25). According to the success/fail determination, the number of bits per symbol is updated according to the possible bit rates of, at least, 1, 2, or 3 bits per symbol at the transmitter. As broadly as claimed, all of the possible bit rates disclosed by Dirschedl (col. 2, line 45) are both a multiple of 1 and an integer. Therefore, regardless of the decision based upon the threshold, either of the bit per symbol conditions (a predetermined number "multiple of 1" or an integer number) will be met. The method taught by Dirschedl is advantageous because it can be used to provide the maximum possible bit rate according to the capacity of the communications channel. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to modify the ADSL system of Bremer with the restricting symbol size method of Dirschedl because it can be used to

provide the maximum possible bit rate according to the capacity of the communications channel.

Further regarding claim 1, Bremer in view of Dirschedl do not explicitly disclose that the information regarding a data rate *is a data rate*. Furthermore, Gross teaches that information regarding a data rate (or an error rate) is a known functional equivalent to a maximum receive data rate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute information regarding a data rate (i.e. error rate) with a data rate as suggested by Gross (col. 4, lines 29-33) because determining the corollary between an error rate and a maximum receive data rate would be within the level of ordinary skill in the art. That is, they are art recognized functional equivalents.

Regarding claim 2, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 1 as applied above. Further, Bremer in view of Dirschedl, and in further view of Gross disclose the remaining limitations of the claim as applied to the rejection of claim 2 above in view of Bremer in view of Dirschedl taken alone.

Regarding claim 3, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 1 as applied above. Further, Gross discloses that information regarding a data rate (or an error rate) is functionally equivalent to an estimated maximum receive data rate.

Regarding claims 4-6, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 1 as applied above. Further, Bremer in view of

Dirschedl, and in further view of Gross disclose the remaining limitations of the claim as applied to the rejection of claims 4-6 above in view of Bremer in view of Dirschedl taken alone.

Regarding claims 7-12, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of the claims as applied to claims 1-6 above.

Regarding claim 13, Bremer discloses an ADSL system (abstract; col. 6, lines 45-55) for the transmission of high bit rate data services. Bremer discloses a first modem (fig. 2, ref. 40) and a second modem (fig. 2, ref. 20) which each have a receiver and a transmitter as known by one having skill in the art (MOdulate/DEModulate). Bremer does not disclose that the two modems achieve a maximum data rate between them. However, Dirschedl teaches a system wherein a transmitter and a receiver achieve a maximum data rate between them. Dirschedl teaches a transmitter which receives an error rate from a receiver which is indicative of a maximum receive data rate of a receiver and compares it to a threshold (col. 2, line 60 – col. 3, line 25) to select a number of bits per symbol based upon the comparison. Dirschedl teaches a method wherein data is gathered at the side of a receiver regarding the current bit per symbol error rate (col. 2, lines 63-68) and the data is transmitted to a transmitter of the data. A success/fail determination or threshold is compared at the transmitter to determine the quality of the transmission (col. 3, lines 13-25). According to the success/fail determination, the number of bits per symbol is updated according to a pre-selected number of bits per symbol (i.e. 1, 2, or 3) or an integer number of bits per symbol (i.e. 1, 2 or 3) as applied to claim 1 above. It is at least implied that, once a new

bit per symbol rate is determined by the transmitter, the receiver of Dirschedl is instructed to communicate using the selected number of bits per symbol for the utility of the communications pair. The method taught by Dirschedl is advantageous because it can be used to provide the maximum possible bit rate according to the capacity of the communications channel. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to modify the ADSL system of Bremer with the restricting symbol size method of Dirschedl because it can be used to provide the maximum possible bit rate according to the capacity of the communications channel.

Further regarding claim 13, the ADSL system of Bremer in view of Dirschedl discloses a transmitter which receives an error rate from a receiver but does not explicitly disclose that the error rate is an estimated maximum receive data rate. However, Gross teaches that an error rate is an art accepted equivalent to a maximum achievable data rate as applied to claim 1 above. Therefore it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize an estimated maximum receive data rate rather than an error rate for updating transmission parameters because, as taught by Gross, they are art accepted equivalents as applied to claim 1 above.

Regarding claim 14, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 13 as applied above. Further, Dirschedl discloses that the pre-selected number of bits per symbol based upon the comparison is one of a multiple of 1 (col. 2, line 45). The 2, 4, or 8 PSK modulation techniques correspond to

1, 2, or 3 bits per symbol respectively. Therefore, the pre-selected number of bits is 1. Bremer in view of Dirschedl, and in further view of Gross do not explicitly disclose that the pre-selected number of bits per symbol is one of a multiple of 2. However, the use of a "multiplier" of bits per symbol of greater than 1 (2, for instance) is not disclosed as being used to solve a particular problem or provide any particular advantage. Furthermore, one skilled in the art would find it obvious to use bit per symbol rates of 4, 8, 16, or 32 as is commonly performed in the art. Such bit rates would be "multiples of 2" and are obvious to one having skill in the art because they are well known bit rates.

Regarding claim 15, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 14 as applied above. Dirschedl discloses using a threshold or testing against a preset value to compare the information regarding the data rate (col. 3, lines 12-25). Dirschedl discloses the use of 1, 2, or 3 bits per symbol (col. 2, line 45) dependent upon the outcome of the threshold comparison and, depending upon the quality of the radio channel, bit rates from 900bits per second to 5400 bits per second (col. 3, lines 25-30). Bremer in view of Dirschedl do not disclose expressly that the threshold is 1Mbits per second or 250Kbits per second and transmitting symbols using a multiple of 8 bits per symbol if the information is above the threshold. However, at the time the invention was made, it would have been obvious to a person having ordinary skill in the art to utilize any one of a various number of thresholds and corresponding bit per symbol rates determined empirically. The Applicant has not disclosed that the particular claimed thresholds or corresponding bit per symbol rate provide an advantage, are used for a particular purpose, or solves a

stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with any of a various number of threshold levels and corresponding bit per symbol rates derived empirically because each transmission system may need to be tuned according to the capacity of the communications channel and the desired data rate of the system. Therefore, it would have been obvious to one of ordinary skill in this art to modify Bremer in view of Dirschedl to obtain the invention as specified in the claim.

Regarding claim 16, Bremer in view of Dirschedl, and in further view of Gross disclose the limitation of claim 14 above. Further, the additional limitations of claim 16 are disclosed by Bremer in view of Dirschedl as applied to claim 15 above. Here, the use of a threshold of 2Mbits per second or 500Kbits per second and transmitting using a multiple of 4 bits per symbol if the information is above the threshold is considered a matter of design choice as applied to claim 4 above.

Regarding claim 17, Bremer in view of Dirschedl, and in further view of Gross disclose the limitation of claim 14 above. Further, the additional limitations of claim 17 are disclosed by Bremer in view of Dirschedl as applied to claim 15 above. Here, the use of a threshold of 3Mbits per second or 750Kbits per second and transmitting using a multiple of 2 bits per symbol if the information is above the threshold is considered a matter of design choice as applied to claim 4 above.

Regarding claim 18, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 14 as applied above. Further, Dirschedl discloses that the transmissions errors are recorded using the CRC code (col. 2, lines 59-63) and

send to the transmitter (col. 2, lines 65-68). As broadly as claimed, the number of transmission errors send by the receiver to the transmitter is considered to be a training signal.

Regarding claim 19, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 14 as applied above. Further, Dirschedl discloses that the error rate transmitted from the receiver is compared with the threshold (col. 3, lines 13-25). The error rate received from the receiver is considered to be an estimate of the maximum receive data rate of the receiver because it describes if the receiver is receiving too much or possibly too little data. The error rate, or estimated maximum receive data rate, is compared with the threshold.

Regarding claim 20, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claim 14 as applied above. Further, it is implied in the system of Bremer in view of Dirschedl by the teachings of Dirschedl that the first modem will adjust the data rate of the transmitter according to the threshold comparison of the second modem. One skilled in the art understands that both a receiver and a transmitter must be using the same data rate and bit per symbol rate for the utility of the data communications. Further, it is implied that a manager or system hardware would effect the use of the correct number of bits per symbol.

Regarding claims 21 and 22, Bremer in view of Dirschedl, and in further view of Gross disclose the limitations of claims 1 and 7 as applied above. Further, Dirschedl discloses that the pre-selected number of bits per symbol based upon the comparison is one of a multiple of 1 (col. 2, line 45). The 2, 4, or 8 PSK modulation techniques

correspond to 1, 2, or 3 bits per symbol respectively. Therefore, the pre-selected number of bits is 1. Bremer in view of Dirschedl, and in further view of Gross do not explicitly disclose that the pre-selected number of bits per symbol is one of a multiple of 2. However, the use of a "multiplier" of bits per symbol of greater than 1 (2, for instance) is not disclosed as being used to solve a particular problem or provide any particular advantage. Furthermore, one skilled in the art would find it obvious to use bit per symbol rates of 4, 8, 16, or 32 as is commonly performed in the art. Such bit rates would be "multiples of 2" and are obvious to one having skill in the art because they are well known bit rates.

Allowable Subject Matter

5. No claims are allowed.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Perilla
August 22, 2007

jmp

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER